AMENDMENTS TO THE CLAIMS:

Please add new claims 43-45 and amend the claims as follows:

1. (Currently Amended) A spin-current switched magnetic memory element, comprising:

a plurality of magnetic layers, comprising:

a fixed magnetic layer having a fixed magnetic moment; and

a free magnetic layer having a magnetic moment which is switchable by a spin-current; and

a barrier layer formed between said fixed and free magnetic layers,

wherein said plurality of magnetic layers includes a perpendicular magnetic anisotropy component, H_p, with a magnitude sufficient to at least substantially offset an easy-plane demagnetization effect $4\pi M_s$, where M_s is a saturation magnetization, such that said perpendicular magnetic anisotropy component, H_p, reduces an amount of spin current needed to rotate said magnetic moment of said free magnetic layer out of the film plane, and

wherein said perpendicular magnetic anisotropy component, H_p, comprises one of:

an interface-induced perpendicular magnetic anisotropy component which originated at an interface within a multilayer structure in the free magnetic layer;

a strain-induced perpendicular magnetic anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer; and

a crystalline anisotropy-induced perpendicular anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer.

2. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein at least one of said fixed and free magnetic layers comprises a composite layer.

3. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 2, wherein said composite layer comprises a platinum layer and a cobalt layer.

4. (Withdrawn - Previously Presented) The spin-current switched magnetic memory

element according to claim 2, wherein said composite layer comprises a gold layer and a cobalt layer.

5. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 2, wherein said composite layer comprises a nickel layer and a copper layer.

6. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 2, wherein said composite layer comprises a magnetic film and non-magnetic film, said perpendicular magnetic anisotropy component being formed at an interface between said magnetic film and said non-magnetic film of said composite layer.

7. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 6 wherein said perpendicular magnetic anisotropy component comprises a bulk perpendicular magnetic anisotropy component which is formed in said magnetic film of the said composite layer.

8. (Previously Presented) The spin-current switched magnetic memory element according to claim 1, further comprising:

first and second leads; and

a pillar formed between said first and second leads, said pillar including said barrier layer and at least one of said fixed and free magnetic layers.

9. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 8, wherein said pillar comprises said free magnetic layer.

10. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 9, wherein said magnetic moment of said free magnetic layer included in said pillar is switchable by an electrical current having a density of no more than about 10^6 A/cm^2.

11. (Withdrawn) The spin-current switched magnetic memory element according to claim 8,

wherein said barrier layer preserves spin information for an electric current injected into said pillar and provides a resistance to said current.

12. (Previously Presented) The spin-current switched magnetic memory element according to claim 8, wherein at least one of said first and second leads includes one of said fixed and free magnetic layers.

13. (Withdrawn) The spin-current switched magnetic memory element according to claim 1, wherein said plurality of magnetic layers comprises an upper magnetic layer and a lower magnetic layer, said at least one barrier layer being formed between said upper and lower magnetic layers.

14. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 13, wherein said upper magnetic layer comprises one of a platinum layer and a cobalt layer, and a gold layer and a cobalt layer.

15. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 13, wherein said lower magnetic layer comprises one of a cobalt layer and a platinum layer, a cobalt layer formed on a gold layer, and a nickel layer and a copper layer.

16. (Canceled)

17. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said barrier layer comprises a plurality of barrier layers which are alternately formed with said plurality of magnetic layers.

18. (Withdrawn) The spin-current switched magnetic memory element according to claim 8, wherein said pillar comprises a lithographed pillar having a diameter of less than about 100 nm, and having an oblong-shaped cross-section.

19. (Withdrawn - Previously Presented) The spin-current switched magnetic memory

element according to claim 1, wherein said barrier layer comprises a tunneling barrier layer.

20. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said barrier layer comprises at least one of an aluminum oxide layer, a magnesium oxide layer, a doped semiconductor layer, a non-magnetic metal layer and a $SrTiO_3$ layer.

21. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 13, wherein said lower magnetic layer comprises a first nickel layer and a first copper layer, and said upper magnetic layer comprises a second copper layer and a second nickel layer.

22. (Withdrawn) The spin-current switched magnetic memory element according to claim 21, wherein said second nickel layer has a thickness which is different than a thickness of said first nickel layer, and has a magnetic moment which is perpendicular to a film plane, and

wherein one of said first and second nickel layers represents an information storage state and has a magnetic moment which is rotatable under an influence of a write current, and the other provides a reference magnetic direction which is not rotatable under said influence of said write current.

23. (Withdrawn) The spin-current switched magnetic memory element according to claim 13, wherein said lower magnetic layer comprises a first cobalt layer formed on a first platinum layer, and said upper magnetic layer comprises a second platinum layer formed on a second cobalt layer.

24. (Withdrawn) The spin-current switched magnetic memory element according to claim 13, wherein said pillar has an electrical resistance which depends on a magnetization direction of said lower magnetic layer with respect to a magnetization direction of said upper layer.

25. (Withdrawn) The spin-current switched magnetic memory element according to claim 13, wherein said pillar comprises a magnetic tunneling junction across said barrier layer between said upper and lower magnetic layers.

26-27. (Canceled)

28-29. (Canceled)

30. (Withdrawn) The spin-current switched magnetic memory element according to claim 1, wherein said perpendicular magnetic anisotropy at least substantially counters an easy-plane demagnetization effect in said plurality of magnetic layers.

31. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said barrier layer comprises at least one of a magnesium oxide layer, a doped semiconductor layer, a non-magnetic metal layer and a $SrTiO_3$ layer.

32. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said magnetic moment of said free magnetic layer is switchable by using only current and without using heat or a magnetic field.

33. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said perpendicular magnetic anisotropy component comprises one of interface-induced perpendicular magnetic anisotropy and strain-induced perpendicular magnetic anisotropy.

34. (Withdrawn - Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said free magnetic layer comprises said perpendicular magnetic anisotropy component, and

wherein a rest-direction of the magnetization of said free magnetic layer does not become perpendicular to the film plane.

35-36. (Canceled)

37. (Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said magnetic moment of said free magnetic layer is switchable via a spin-

polarized electric current or pure spin current injected into said plurality of magnetic layers.

38. (Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said magnetic moment of said free magnetic layer is switchable via an interaction of a spin-polarized current and said magnetic moment of said free magnetic layer in said plurality of magnetic layers.

39. (Previously Presented) The spin-current switched magnetic memory element according to claim 12, wherein said magnetic moment of said free magnetic layer is switchable via an exchange of angular momentum between a spin-polarized current and said free ~~a~~ magnetic layer in said plurality of magnetic layers.

40. (Currently Amended) A spin-current switched magnetic memory element, comprising:

a plurality of magnetic layers comprising

a first magnetic layer comprising a fixed magnetic moment; and

a second magnetic layer comprising a magnetic moment which is switchable by a spin-current; and

a barrier layer formed between said first and second magnetic layers,

wherein said plurality of magnetic layers includes a perpendicular magnetic anisotropy component, H_p, with a magnitude sufficient to at least substantially offset an easy-plane demagnetization effect $4\pi M_s$, where M_s is a saturation magnetization, such that said perpendicular magnetic anisotropy component, H_p, reduces an amount of spin current needed to rotate said magnetic moment of said free magnetic layer out of the film plane, and

wherein said perpendicular magnetic anisotropy component, H_p, comprises one of:

an interface-induced perpendicular magnetic anisotropy component which originated at an interface within a multilayer structure in the free magnetic layer;

a strain-induced perpendicular magnetic anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer; and

a crystalline anisotropy-induced perpendicular anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer.

41. (Previously Presented) The spin-current switched magnetic memory element according to claim 1, wherein said memory element comprises one of a spin-valve device and a magnetic tunnel junction-based spin injection switch.

42. (Currently Amended) A spin-current switched magnetic memory element, comprising:

a pair of leads; and

a plurality of magnetic layers formed between said pair of leads, said plurality of magnetic layers comprising:

a fixed magnetic layer having a fixed magnetic moment; and

a free magnetic layer having a magnetic moment which is switchable by a spin-current; and

a barrier layer formed between said fixed and free magnetic layers,

wherein said plurality of magnetic layers includes a perpendicular magnetic anisotropy component, H_p, with a magnitude sufficient to at least substantially offset an easy-plane demagnetization effect $4\pi M_s$, where M_s is a saturation magnetization, such that said perpendicular magnetic anisotropy component, H_p, reduces an amount of spin current needed to rotate said magnetic moment of said free magnetic layer out of the film plane,

wherein at least one of said fixed and free magnetic layers is formed in a cylinder-shaped pillar disposed between said pair of leads,

wherein said memory element comprises one of a spin-valve device and a magnetic tunnel junction-based spin injection switch,

wherein said a perpendicular magnetic anisotropy component comprises one of interface-induced perpendicular magnetic anisotropy component and strain-induced perpendicular magnetic anisotropy component, and

wherein said perpendicular magnetic anisotropy component comprises a component of magnetic anisotropy which is perpendicular to a film plane in said plurality of magnetic layers, and

wherein said perpendicular magnetic anisotropy component, H_p, comprises one of:

an interface-induced perpendicular magnetic anisotropy component which originated at an interface within a multilayer structure in the free magnetic layer;

a strain-induced perpendicular magnetic anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer; and

a crystalline anisotropy-induced perpendicular anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer.

43. (New) The spin-current switched magnetic memory element according to claim 1, wherein said perpendicular magnetic anisotropy component, H_p, comprises the interface-induced perpendicular magnetic anisotropy component which originated at the interface within the multilayer structure in the free magnetic layer.

44. (New) The spin-current switched magnetic memory element according to claim 1, wherein said perpendicular magnetic anisotropy component, H_p, comprises the strain-induced perpendicular magnetic anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer.

45. (New) The spin-current switched magnetic memory element according to claim 1, wherein said perpendicular magnetic anisotropy component, H_p, comprises the crystalline anisotropy-induced perpendicular anisotropy component which originated within at least one of the fixed magnetic layer and free magnetic layer.